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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/857,205	06/22/2001	Ralf Wolleschensky	P66760US0	6182

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EXAMINER	
LAVARIAS, ARNEL C	
ART UNIT	**PAPER NUMBER**
2872	

DATE MAILED: 07/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/857,205	WOLLESCHENSKY, RALF	
	Examiner	Art Unit	
	Arnel C. Lavarias	2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 June 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *12-68* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *12-68* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 6/23/04 has been entered.

Response to Amendment

2. The amendments to Claims 12, 15-16, 18, 20-22, 24, 27-28, 37, 43, 50-52, 54-58, and 62 in the submission dated 6/23/04 are acknowledged and accepted. In view of these amendments, the rejections of Claims 12-65 under 35 U.S.C. 112, 2nd paragraph, in Sections 9-10 of the Office Action dated 1/27/04 are respectfully withdrawn.

3. The addition of Claims 66-68 in the submission dated 6/23/04 is acknowledged and accepted.

Response to Arguments

4. The Applicant argues that, with respect to newly amended Claims 12, 22, 24, 28, 37, 43, and 58, Kobayashi in view of Trutna, Jr. fails to teach or reasonably suggest a fluorescence scanning confocal microscope, including light diffracting means for feeding

the excitation light into the microscope beam path by diffraction of the excitation light and for separating excitation light and wavelength-shifted emission light emitted by the sample in the microscope beam path by diffraction of the excitation light, wherein wavelength-shifted emission light is transmitted undiffracted through the light-diffracting means and the light diffracting means is so positioned with respect to the beam path and the detection means that only undiffracted light is detected by the detection means. After a review of the Kobayashi and Trutna, Jr. references, the Examiner agrees, and respectfully withdraws the rejections of Claims 12-65 in Sections 12-14 of the Office Action dated 1/27/04.

5. Claims 12-68 are rejected as follows.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

7. Claims 12-20, 22-25, 27-32, 37-39, 51, 53-55, 57, 63-68 are rejected under 35 U.S.C. 102(a) as being anticipated by Engelhardt et al. (WO99/42884, or Engelhardt '884), of record.

Engelhardt '884 discloses a fluorescence scanning confocal microscope (See Figures 2-6, 8-9; Abstract), comprising a radiation source such as a laser (See 2 in Figure 9) which emits excitation light for irradiating a sample (See 10 in Figure 9), the sample

emitting excitation and wavelength-shifted emission light; a detection device (See 15, 24 in Figure 9) for detection of emission light emitted by the sample; an excitation and detection pinhole (See 22 in Figure 6; pinhole between elements 18 in Figure 8); microscope optics (See for example 1 in Figure 9) for directing excitation light to the sample and for directing emission light back in the direction of the radiation source and detection device; a plurality of acousto-optic elements (See for example 17, 19, 4 in Figures 5-6, 9), such as AOTF's or AOD's, for diffracting excitation light into multiple orders, such as the zero and first order (See for example Page 5, line 25-Page 6, line 16) and for separating excitation light and wavelength-shifted emission light emitted by the sample by diffraction of the excitation light (The Examiner notes that the systems of Figures 2-6, 8-9 are used for fluorescence measurements; the acousto-optic devices operate on diffraction principles and thus has wavelength-dependent diffracting characteristics; and both scattered fluorescence and source wavelengths pass through the acousto-optic device) and which is positioned between the radiation source and microscope optics in such a way that diffracted excitation light can be introduced into the microscope optics, wherein the emission light emitted by the sample has fractions of excitation light and fractions of wavelength–shifted fluorescence light (it is noted that upon excitation by the source, the sample will emit its characteristic fluorescence, as well as specularly and diffusely reflect and transmit a portion of the source light), excitation light emitted by the sample is deflected in the direction of the radiation source by diffraction by the acousto-optic device, and wavelength-shifted fluorescence light emitted by the sample is transmitted through the acousto-optic element and is spatially separable

from excitation light fractions of the emission light, and wherein the detection device is so positioned with respect to the acousto-optic element that wavelength-shifted fluorescence light transmitted through the acousto-optic element is detected by means of the detection device, and further comprising a filter device (See for example 25 in Figure 9) which for the selective detection of wavelength-shifted fluorescence light in the detection device is positioned between the acousto-optic element and the detection device, and at least one optical means, such as a reflecting element (See 6 in Figure 9), for influencing the light direction and for separating the light fractions, which is located in at least one of an excitation beam path upstream of the acousto-optic element and a detection beam path downstream of the acousto-optic element. Engelhardt '884 additionally discloses the acousto-optical means (See 4, 17 in Figure 9) being positioned with respect to each other and the beam path such that only wavelength-shifted emission light that is undiffracted (See 14 in Figure 9) is detected by the detector device (See 24, 15 in Figure 9).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 21, 33-36, 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Engelhardt '884.

Engelhardt '884 discloses the invention as set forth above, except for the optical means being a light refracting element, such as an unvaporized prism. The Examiner notes that the optical element of Engelhardt '884 (See for example 2 in Figure 1) is a simple wavelength dependent beamsplitter performing a light fraction separation function. It is well known in the art that prisms similarly perform such a wavelength separation function based on the refractive properties of the prism material. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the optical means be a light refracting element, such as an unvaporized prism, for the purpose of simplifying the optical layout of the system and reducing the cost, size, and weight of the system.

10. Claims 26, 41-45, 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Engelhardt '884.

Engelhardt '884 discloses the invention as set forth above, except for the acousto-optic deflector elements being an acousto-optic modulator and then an acousto-optic tunable filter in the direction of the microscope optics. The Examiner notes that it is well known in the art that acousto-optic deflectors, modulators, and tunable filters are all the same devices based on the acousto-optic effect in a Bragg cell. Hence, all diffract, modulate, and tune light in the same way, based on the applied acoustic wave onto the device. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the acousto-optic deflectors be an acousto-optic modulator and then an acousto-optic tunable filter in the direction of the microscope

optics for the purpose of providing additional intensity and wavelength adjustability for optimizing the operation of the fluorescence microscope.

11. Claims 46-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Engelhardt '884.

Engelhardt '884 discloses the invention as set forth above, except for the fluorescence microscope further including at least one glass fiber provided for feeding in excitation light. It is well known in the art of optical microscopy and optical spectroscopy to utilize optical fibers to guide excitation light from a source to a sample, as well as to guide emission light from a sample to a detection system, for the purpose of reducing the optical system complexity, size, cost, and weight, as well as for providing a flexible means of routing light within the optical system.

12. Claims 50, 52, 58-62 are rejected under 35 U.S.C. 103(a) as being unpatentable over Engelhardt '884 in view of Asakawa (JP 01282515), of record.

Engelhardt '884 discloses the invention as set forth above. Engelhardt '884 additionally discloses the radiation source being constructed as a plurality of lasers having different wavelengths (See 2 in Figures 3-4; Page 5, line 25-Page 7, line 17). Engelhardt '884 lacks a plurality of acoustic-optical elements being provided and with each laser is associated at least one acousto-optical element. However, Asakawa teaches an optical microscope (See Figures 1 or 4) wherein the optical source and acousto-optical devices are provided as a plurality of optical laser sources (See 1, 2, 3 of Figure 1 or 4) and as a plurality of acousto-optical modulator devices (See 7, 8, 9 in Figures 1 or 4), respectively, such that different wavelengths can be simultaneously fed into the

microscope beam path (See Figures 1 or 4). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have a plurality of acoustic-optical elements be provided and with each laser is associated at least one acousto-optical element, as taught by Asakawa, in the fluorescence microscope of Engelhardt '884, for the purpose of simplifying the optical detection system as well as reduce the cost of the optical system.

13. Claim 56 is rejected under 35 U.S.C. 103(a) as being unpatentable over Engelhardt '884 in view of Asakawa.

Engelhardt '884 in view of Asakawa discloses the invention as set forth above. Asakawa additionally discloses that the light beams of the three lasers (See 1, 2, 3 in Figure 1 or 4) are switchable in order with time according to the applied high frequency signal applied to the acousto-optical modulator (See 7, 8, 9 in Figures 1 or 4; Abstract). However, Engelhardt '884 in view of Asakawa lacks the radiation of the plurality of lasers being fed into the microscope path in a sequence based on decreasing wavelength. It would have been obvious to one having ordinary skill in the art at the time the invention was made to adjust the timing sequence of the lasers of Engelhardt '884 in view of Asakawa such that the radiation of the plurality of lasers are fed into the microscope path in a sequence based on decreasing wavelength since the order or sequence of the radiation of the lasers entering the microscope beam path is not critical to the operation of the function of the fluorescence microscope, and one skilled in the art would know to adjust the order or sequence based on time of arrival of the excitation pulse onto the sample, as per the intended application. One would have been motivated

to have the radiation of the plurality of lasers be fed into the microscope path in a sequence based on decreasing wavelength to collect, simplify and organize the fluorescence data collected from the detection system based on excitation wavelength sequence.

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent No. 6510001 and U.S. Patent No. 6654165, both to Engelhardt et al.

U.S. Patent No. 6510001 and U.S. Patent No. 6654165 are U.S. Patents that have issued based on the WO/9942884 publication to Engelhardt '884.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Arnel C. Lavarias whose telephone number is 571-272-2315. The examiner can normally be reached on M-F 8:30 AM - 5 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Arnel C. Lavarias
7/7/04

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